I CLAIM AS MY INVENTION:

1. A magneto-optical readout head for reading magnetically stored data for use with a source of illuminating light having a wavelength, comprising:

an optically transparent substrate having a surface adapted to face a magnetic storage medium;

an optically transparent Faraday effect rotator, having a Faraday coefficient θ_K, disposed on said surface of said substrate and having a Faraday effect rotator surface adapted to face ~~a~~ said magnetic storage medium; and

an optically reflective Kerr effect rotator, having a Kerr coefficient θ_K, disposed on said Faraday rotator surface, with θ_F and θ_K having a same operational sign at said wavelength of said illuminating light.

2. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotator comprises a layer of material exhibiting the Faraday effect in a presence of a magnetic field.

3. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a layer of material exhibiting the Kerr effect in a presence of a magnetic field.

4. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotator and said Kerr rotator have respective magnetic domain structures, and wherein said substrate has a shape at a side facing away from said surface of said

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substrate for magnifying said magnetic domain structures of said Faraday rotator and said Kerr rotator.

5. A magneto-optical readout head as claimed in claim 1 wherein said substrate is comprised of optical grade glass.

6. A magneto-optical readout head as claimed in claim 1 wherein said substrate is comprised of monocrystalline garnet.

7. A magneto-optical readout head as claimed in claim 6 wherein said substrate is comprised of gadolinium gallium garnet.

8. A magneto-optical readout head as claimed in claim 6 wherein said substrate is comprised of gadolinium gallium garnet containing scandium.

9. A magneto-optical readout head as claimed in claim 6 wherein said substrate is comprised of a material having a composition $X_3Y_5O_{12}$, wherein X comprises at least one element selected from the group consisting of gadolinium and calcium, wherein Y comprises at least one element selected from the group consisting of gallium, magnesium and zirconium, and wherein O is oxygen.

10. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotator is comprised of a ferrite-garnet film on said substrate surface.

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11. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a platinum-cobalt multi-layer structure.

12. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a multi-layer platinum-nickel and cobalt structure.

13. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a GdFe layer.

14. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a GdFeCo layer.

15. A magneto-optical readout head as claimed in claim 1 wherein said Kerr rotator comprises a layer of an Fe-Ni based material having a small coercivity and a magnetization vector substantially perpendicular to said Faraday rotator surface.

16. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotator is comprised of a ferrite-garnet material.

17. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotatory is comprised of a hexaferrite material.

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18. A magneto-optical readout head as claimed in claim 1 wherein said Faraday rotator comprises a sphinel ferrite film.

19. A method for making a magneto-optical readout head for reading magnetically stored data, using illuminating light having a wavelength comprising the steps of:

providing an optically transparent substrate having a surface adapted to face a magnetic storage medium;

applying an optically transparent Faraday effect rotator, having a Faraday coefficient θ_F on said surface of said substrate, having a Faraday effect rotator surface adapted to face ~~a~~ said magnetic storage medium; and

applying an optically reflective Kerr effect rotator, having a Kerr coefficient θ_K on said Faraday rotator surface, with θ_F and θ_K having a same operational sign at said wavelength of said illuminating light.

20. A method as claimed in claim 19 comprising applying as said Faraday rotator a layer of material exhibiting the Faraday effect in a presence of a magnetic field.

21. A method as claimed in claim 19 comprising applying as said Kerr rotator a layer of material exhibiting the Kerr effect in a presence of a magnetic field.

22. A method as claimed in claim 19 wherein said Faraday rotator and said Kerr rotator have respective magnetic domain structures, and comprising providing said substrate with a shape at a side facing away from said surface of said substrate for magnifying said magnetic domain structures of said Faraday rotator and said Kerr rotator.

23. A method as claimed in claim 19 comprising providing a substrate comprised of optical grade glass as said substrate.

24. A method as claimed in claim 19 comprising providing a substrate comprised of monocrystalline garnet as said substrate.

25. A method as claimed in claim 24 comprising providing a substrate comprised of gadolinium gallium garnet as said substrate.

26. A method as claimed in claim 24 comprising providing a substrate comprised of gadolinium gallium garnet containing scandium as said substrate.

27. A method as claimed in claim 24 comprising providing a substrate comprised of a material having a composition $X_3Y_5O_{12}$ as said substrate, wherein X comprises at least one element selected from the group consisting of gadolinium and calcium, wherein Y comprises at least one element selected from the group consisting of gallium, magnesium and zirconium, and wherein O is oxygen.

28. A method as claimed in claim 19 comprising applying a ferrite-garnet film on said substrate surface as said Faraday rotator.

29. A method as claimed in claim 19 comprising applying a platinum-cobalt multi-layer structure on said Faraday rotator surface as said Kerr rotator.

30. A method as claimed in claim 19 comprising applying a multi-layer platinum-nickel and cobalt structure on said Faraday rotator surface as said Kerr rotator.

31. A method as claimed in claim 19 comprising applying a GdFe layer on said Faraday rotator surface as said Kerr rotator.

32. A method as claimed in claim 19 comprising applying a GdFeCo layer on said Faraday rotator surface as said Kerr rotator.

33. A method as claimed in claim 19 comprising applying a layer of an Fe-Ni based material, having a small coercivity and a magnetization vector substantially perpendicular to said Faraday rotator surface, on said Faraday rotator surface as said Kerr rotator.

34. A method as claimed in claim 19 comprising applying a ferrite-garnet material on said substrate surface as said Faraday rotator.

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35. A method as claimed in claim 19 comprising applying a hexaferrite material on said substrate surface as said Faraday rotator.

36. A method as claimed in claim 19 comprising applying a sphinel ferrite film on said substrate surface as said Faraday rotator.

37. A method for reading out magnetically stored data from a magnetic storage medium comprising the steps of:

disposing an optically transparent Faraday rotator, having a Faraday coefficient θ_F, and an optically reflecting Kerr rotator, having a Kerr coefficient θ_K, in succession above ~~a~~ said magnetic storage medium, with said Kerr rotator disposed between said Faraday rotator and said magnetic storage medium, said magnetic storage medium containing magnetically stored data which produces a magnetic field in each of said Kerr rotator and said Faraday rotator, with θ_F and θ_K having a same operational sign at a wavelength;

directing linearly polarized light, having said wavelength and having a polarization vector, through said Faraday rotator and reflecting said linearly polarized light at said Kerr rotator back through said Faraday rotator to produce polarized light with said polarization vector rotated by a rotation angle having a magnitude dependent on said magnetic field in said Faraday rotator and said Kerr rotator; and

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detecting and analyzing said polarized light with said polarization vector rotated by said rotation angle and reading out said magnetically stored data by monitoring the magnitude of said rotation angle.

38. A method as claimed in claim 37 wherein the step of producing said polarized light with said polarization vector rotated by a rotation angle comprises producing polarized light with said polarization vector rotated by a rotation angle of substantially 4°.

39. A method as claimed in claim 37 wherein said Faraday rotator and said Kerr rotator respectively exhibit domain structures, and comprising the additional step of passing said polarized light with said polarization vector rotated by a rotation angle through a structure for magnifying said domain structures of said Faraday rotator and said Kerr rotator.

40. A method as claimed in claim 39 comprising the additional step of joining said structure for magnifying said domain structures, said Faraday rotator and said Kerr rotator in a unitary magneto-optical head.

41. A method as claimed in claim 37 comprising the additional step of joining said Faraday rotator and said Kerr rotator in a unitary magneto-optical head.

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